

REMARKS

The Examiner has rejected claims 1 and 9 under 35 USC 103 as being unpatentable over US 6,480,088 (Okamoto) in view of US 5,583,475 (Raholijaona et al), yet in further view of US 6,762,666 (Chu).

In the Office Action, the Examiner states her opinion that it is obvious to combine the teachings of Okamoto with the teachings of Raholijaona to form a coil with a central cavity in order to slip a core therethrough, in further view of Chu which discloses a toroidal core having an air-gap on one side of the body of the core.

Applicant believes however that this reasoning is erroneous since both Okamoto and Chu teach in the opposite direction to the invention as defined in present claim 1. Both Okamoto and Chu disclose coils that are wound around a closed toroidal magnetic core that is completely closed and would thus make it impossible to insert a coil with a connector and end plate on the magnetic core. While Chu may disclose one of the toroidal cores with an air-gap, at least one other toroidal core is completely closed (see Figures 1-4, 5, and 7 of Chu), whereby the core with air-gap is stacked with a core without air-gap.

As has already been previously argued by the Applicant, choke coils have continuous toroidal magnetic cores in order to increase coupling between the two coils and to reduce leakage flux. The additional toroidal core with air-gap disclosed in Chu merely functions to reduce saturation, however, it is stacked with a closed toroidal core without air-gap, for the purpose of reducing leakage flux and increase the coupling between the two coils (in Chu, the two coils that are coupled are referenced as 110 and 120).

Thus, the combination of Okamoto, Raholijaona and Chu would not lead to the invention according to present claim 1, and in fact Chu and Okamoto both teach in the opposite direction in that they each disclose two coils wound around at least one continuous toroidal core such that it

would be impossible to insert the coils on the core and impossible to insert an end plate and connector on the magnetic core, as required by present claim 1.

Present **claim 1** has been amended to better define the invention over the prior art, in particular to specify that there is a single magnetic core with air-gap. Moreover, Applicant believes that the Examiner has not fully considered Applicant's prior arguments, since the Examiner has not specifically shown in Okamoto both a connector and an end plate arranged at respective first and second ends of the magnetic coil. In particular, the protection plate identified by the Examiner serves to carry a magnetic shield strip in Okamoto and in no way is mounted at either end of the two separate coils shown in Okamoto, and, moreover, the protection plate is also not mounted on the toroidal magnetic core with the central cavity in which the magnetic coils are inserted, as required by present claim 1. As already argued, the protection plate in Okamoto is mounted around both the magnetic circuit and magnetic coil and neither the end plate nor the connector comprises a central cavity in which the magnetic core is inserted. As already discussed above, this would, in fact, be impossible since both Okamoto and Chu disclose toroidal cores that are completely closed (at least one in Chu), whereby it would be impossible to have a connector or end plate with the central cavity inserted thereon.

As concerns **claim 9**, Applicant believes that the Examiner has not fully considered Applicant's previous arguments, since the Examiner has merely stated that Okamoto illustrates that the base plate/connector plate contains holes through which ends of the wire/coil are positioned, which however, does not correspond to the language of claim 9. Claim 9 requires that the connector housing comprises a guide portion around which the portion of the coil is wound, such feature not being specifically disclosed in any of the prior art cited.

The Examiner is respectfully invited to indicate where in Okamoto, Chu, or any of the other prior art there is a connector housing comprising a guide portion around which a portion of the coil is wound, as specified in present claim 9 (with further regard to claim 1).

Hayama is cited by the Examiner as disclosing an end plate having coil means that guides a filament wire, such that the feature of present **claim 8** would have been obvious to the skilled person in view of Okamoto, or Raholijaona. However, the end plate referred to by the Examiner in Hayama is part of a coil manufacturing apparatus, and not part of an end plate that is part of a magnetic circuit, as required by present claim 8 in view of present claim 1. Thus, Hayama in fact teaches in the completely opposite direction, encouraging the skilled person to use an end plate on the apparatus, and not at the end of a coil that is inserted on the magnetic core, as required in the present invention according to present claim 8.

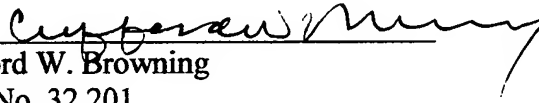
Concerning **claims 2 and 3**, Applicant believes that Applicant's previous arguments have not been fully considered. A skilled person would not consider the teachings of Skinner since they relate to an ignition coil that is in a completely different technical field from a magnetic circuit or current sensor. Even if the skilled person were to consider Skinner, which is not admitted, the value of the angle shown in Skinner is so far off the range claimed in present claims 2 and 3 that the skilled person would not arrive at the value $\tan \alpha$ ranging between 0.001 and 0.01 in application of *re Aller*. In this regard, Applicant is of the opinion that since the value of $\tan \alpha$ in Skinner is significantly larger than the presently claimed range, even if the skilled artisan were to consider Skinner, such artisan would work around the range disclosed in Skinner, which however is so far off the presently claimed range that it would not involve routine skill to arrive at the claimed range.

Claim 4 has been rewritten as an independent claim, including all the features of claim 1, and amended claim 4 is believed to now be allowable by the Examiner, as previously instructed, which is gratefully acknowledged.

Claims 5 - 7 depend on claim 4, and thus are also believed allowable.

Applicant now believes the amended claims 1-9 to be allowable. However, should the Examiner have any further objections, prompt issuance of an Advisory Action is respectfully requested.

Respectfully submitted,

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